



M80

Quectel Cellular Engine



EVB User Guide

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0. Revision history

Revision	Date	Author	Description of change
1.0	2011-12-09	Ray Xu	Original

1. Introduction

This document defines and specifies the usage of M80 EVB. Customers can get useful information about M80 EVB from this document.

1.1. Related documents

Table 1: Related documents

SN	Document name	Remark
[1]	M80_ATC	AT commands sets
[2]	GSM_UART_AN	The document of serial port application note
[3]	M80_HD	Hardware design
[4]	GSM_FW_Upgrade_Tool_Lite_GS2_UDG	GSM Firmware upgrade tool lite GS2 ueser guide
[5]	GSM_DUAL_UART_AN_V1.0	GSM_DUAL_UART application Notes

1.2. Safety precautions

The following safety precautions must be observed during all phases of the operation, such as usage, service or repair of any cellular terminal or mobile incorporating M80 module. Manufacturers of the cellular terminal are advised to convey the following safety information to users and operating personnel and to incorporate these guidelines into all manuals supplied with the product. If not so, Quectel does not take on any liability for customer failure to comply with these precautions.



When in a hospital or other health care facility, observe the restrictions on the use of mobile. Switch the cellular terminal or mobile off. Medical equipment may be sensitive to RF energy interference.



Switch off the cellular terminal or mobile before boarding an aircraft. Make sure it switched off. The operation of wireless appliances in an aircraft is forbidden to prevent interference with communication systems. Forget to think much of these instructions may influence the flight safety or offend against local legal action, or both.



Do not operate the cellular terminal or mobile in the presence of flammable gas or fume. Switch off the cellular terminal when you are near petrol station, fuel depot, chemical plant or where blasting operations are in progress. Operation of any electrical equipment in potentially explosive atmosphere can constitute a safety hazard.



Your cellular terminal or mobile receives and transmits radio frequency energy while switched on. RF interference can occur if it is used close to TV set, radio, computer or other electric equipment.



Road safety comes first! Do not use a hand-held cellular terminal or mobile while driving a vehicle, unless it is securely mounted in a holder for hands-free operation. Before making a call with a hand-held terminal or mobile, park the vehicle.



GSM cellular terminals or mobiles operate using radio frequency signal and cellular network. Because of this, the connection cannot be guaranteed in all conditions, for example no mobile fee or an invalid SIM card. While you are in this condition and need emergent help, please remember using emergency call. In order to make or receive calls, the cellular terminal or mobile must be switched on and in a service area with adequate cellular signal strength.

Some networks do not allow for emergency call if certain network services or phone features are in use (e.g. lock functions, fixed dialing etc.). You may have to deactivate those features before you can make an emergency call.

Also, some networks require that a valid SIM card be properly inserted in cellular terminal or mobile.

2. EVB kit introduction

2.1. EVB top and bottom view

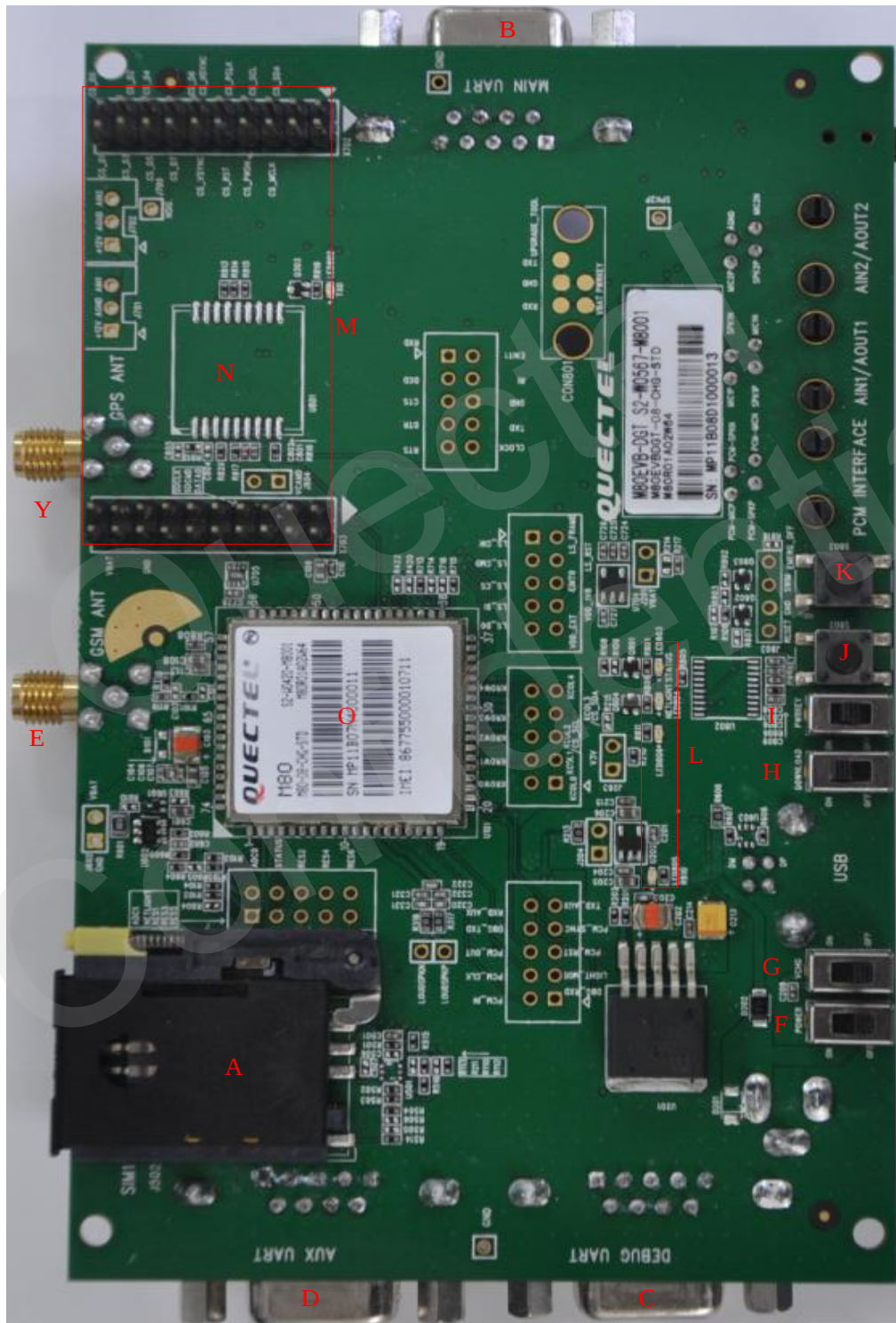


Figure 1: EVB top view

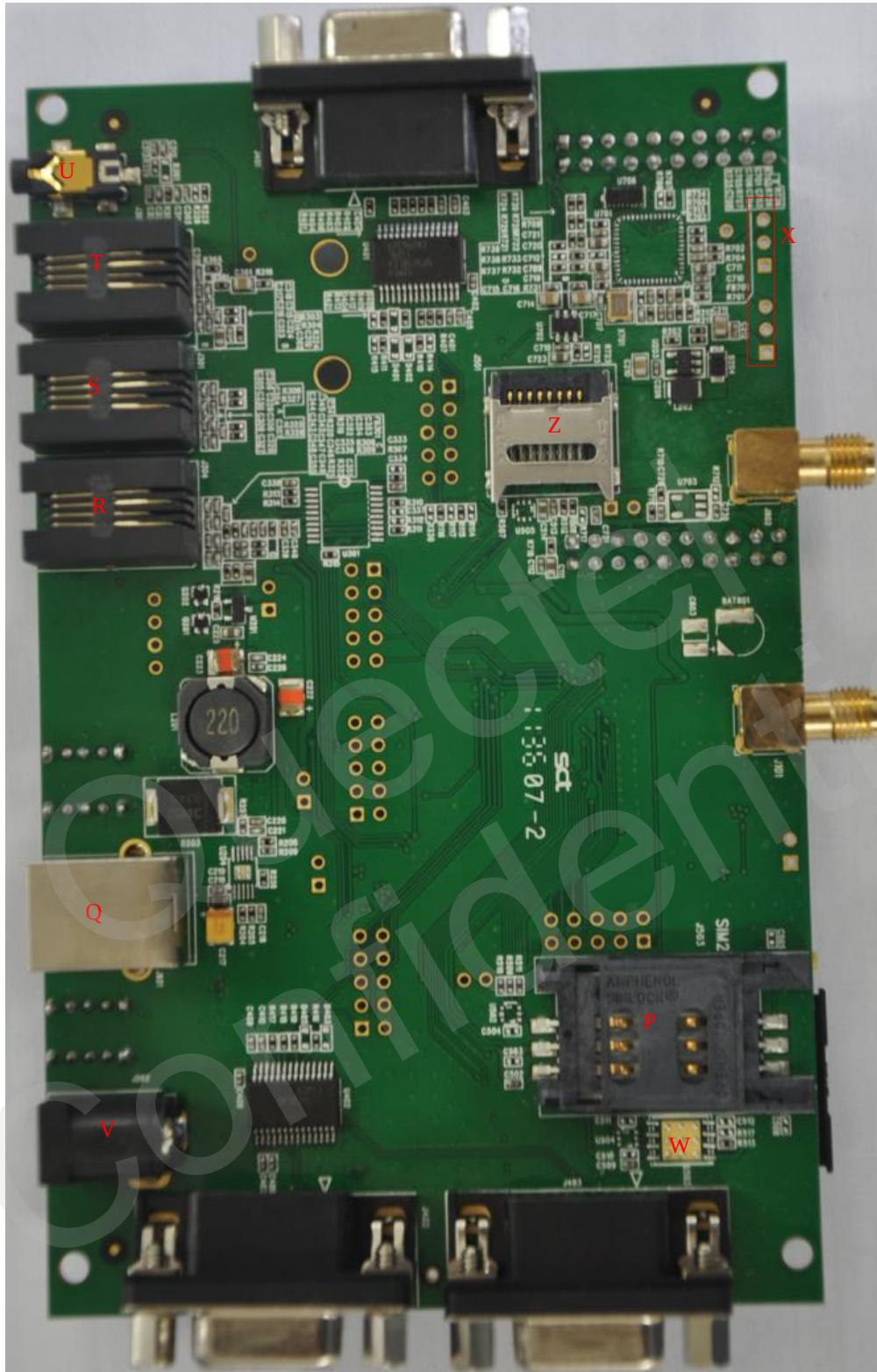


Figure 2: EVB bottom view

- A: SIM1 card cassette
- B: Main UART port
- C: Debug UART port
- D: Auxiliary UART port

E: GSM RF connector
F: 5V switch
G: VCHG switch
H: Switch for USB download
I: PWRKEY switch
J: PWRKEY button
K: EMERG_OFF button
L: LED indicator
M: Camera interface
N: GPS module
O: M80 module
P: SIM2 card cassette
Q: USB interface
R: PCM audio
S: Handset interface of audio channel 1
T: Handset interface of audio channel 2
U: Earphone interface of audio channel 2
X: Analogy camera interface
Y: GPS RF connector
Z: SD card cassette

2.2. EVB accessories



Figure 3: Introduction to accessories

- A: USB to UART converter cable
- B: USB cable
- C: Earphone
- D: 5V DC adapter
- E: Bolts and nuts for fixing module and EVB
- F: RF cable and Antenna

3. Interface application

3.1. Power interface

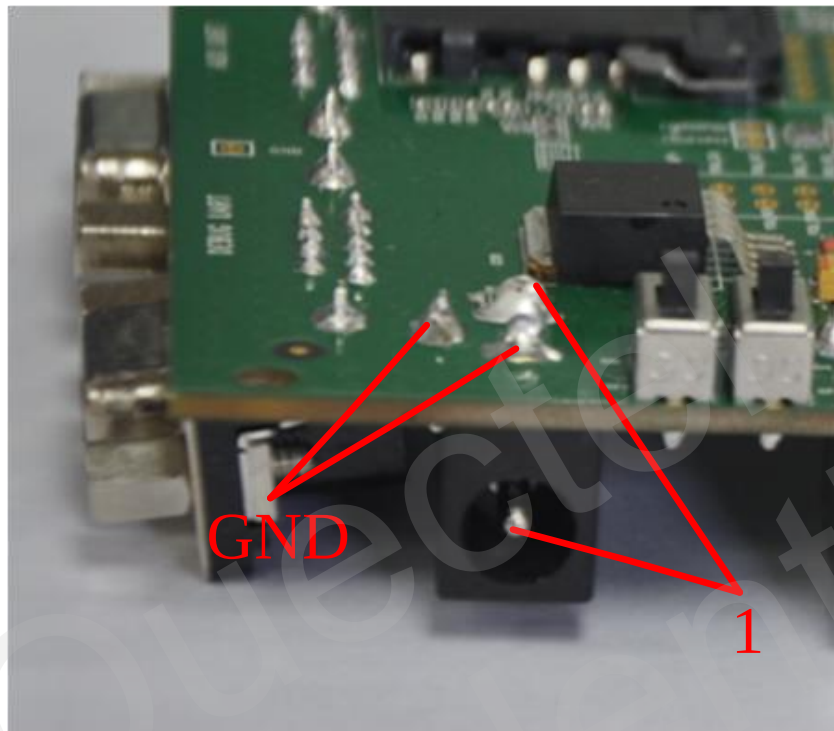


Figure 4: Power interface

Table 2: Pin of power interface

Pin	Signal	I/O	Description	
1	Adapter input	I	5V/2A DC source input	

3.2. Audio interface

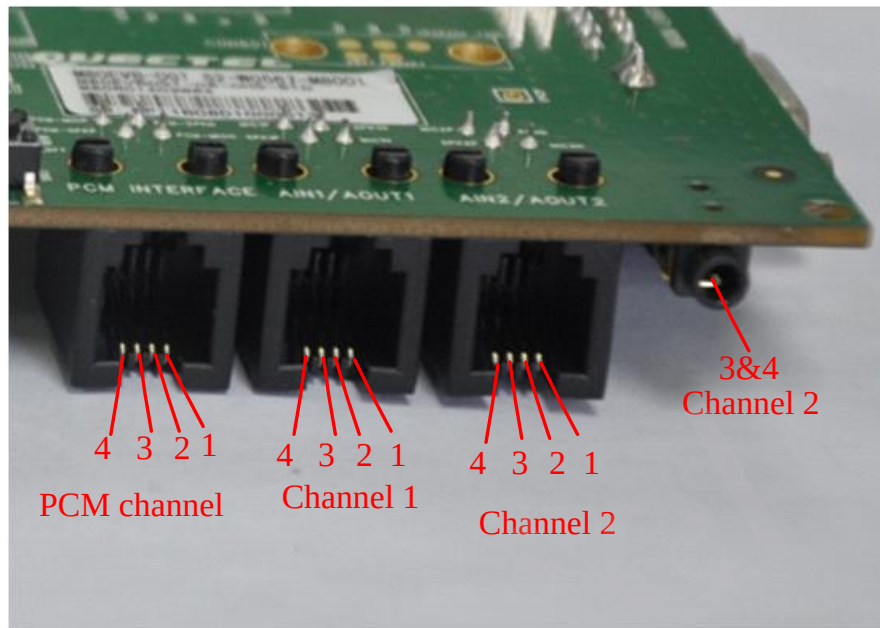


Figure 5: Audio interface

Table 3: Pins of PCM channel

Pin	Signal	I/O	Description	Note
1	MIC2N	I	Negative microphone input	
2	SPK2N	O	Negative receiver output	
3	SPK2P	O	Positive receiver output	
4	MIC2P	I	Positive microphone input	

An earphone or handset can be used in audio channel 2.

Table 4: Pins of audio channel 2

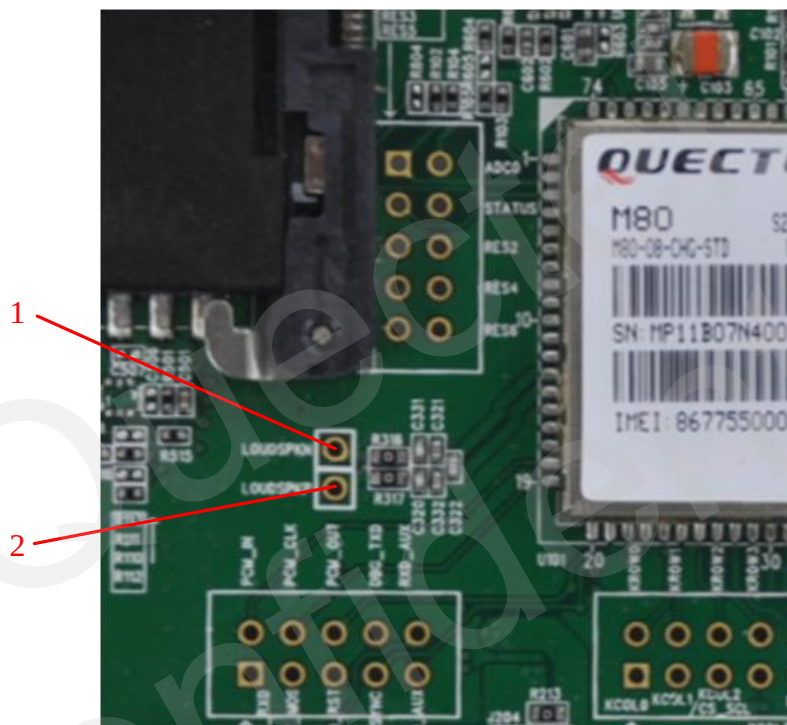
Pin	Signal	I/O	Description	Note
1	MIC2N	I	Negative microphone input	
2	AGND		AGND of audio circuits	
3	SPK2P	O	Positive receiver output	
4	MIC2P	I	Positive microphone input	

An earphone or handset can be used in audio channel 2.

Table 5: Pins of audio channel 1

Pin	Signal	I/O	Description	Note
1	MIC1N	I	Negative microphone input	
2	SPK1N	O	Negative receiver output	
3	SPK1P	O	Positive receiver output	
4	MIC1P	I	Positive microphone input	

3.3. Loud speaker


Figure 6: Loud speaker interface
Table 6: Pins of loud speaker

Pin	Signal	I/O	Description	Note
1	LOUDSPKN	O	Negative loud speaker output	
2	LOUDSPKP	O	Positive loud speaker output	

3.4. SIM card interface

3.4.1 SIM1 card interface

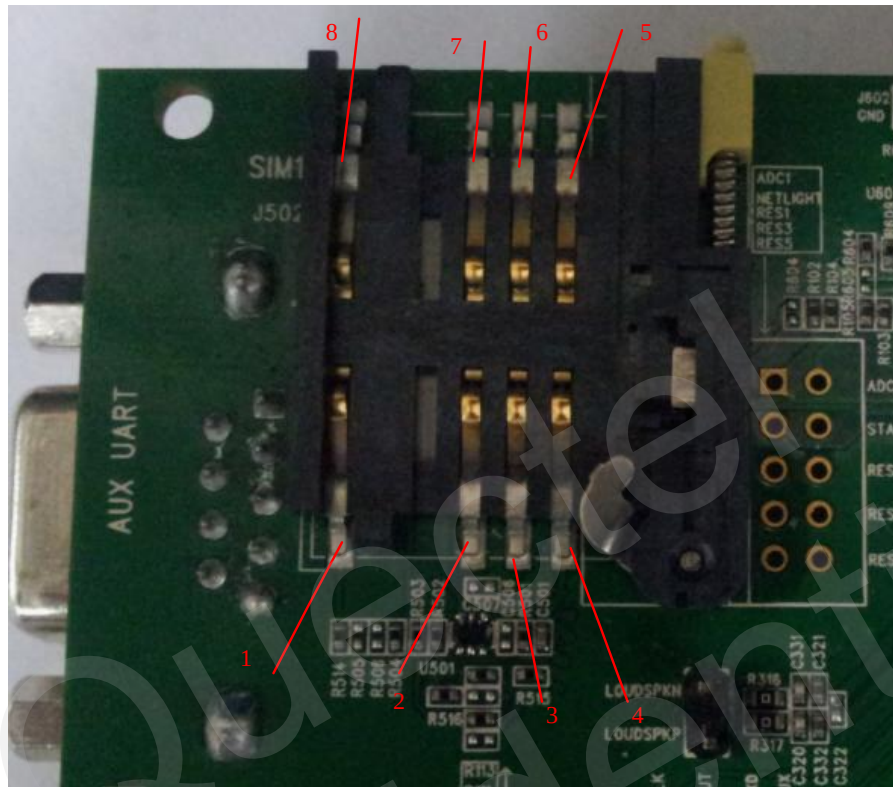


Figure 7: SIM1 card interface

Table 7: Pins of SIM card interface

Pin	Signal	I/O	Description	Note
1	SIM1_PRESENCE	I	SIM card detect	
2	SIM1_CLK	O	SIM card clock	
3	SIM1_RST	O	SIM card reset	
4	SIM1_VDD	O	SIM power	
5	GND	O	GND	
6	VPP	O	SIM card power output	
7	SIM1_DATA	I/O	SIM card data I/O	
8	SIM_DETECT		Pulled down GND with external circuit. When the tray is present, pin 4 is connected to pin 8.	

3.4.2 SIM2 card interface

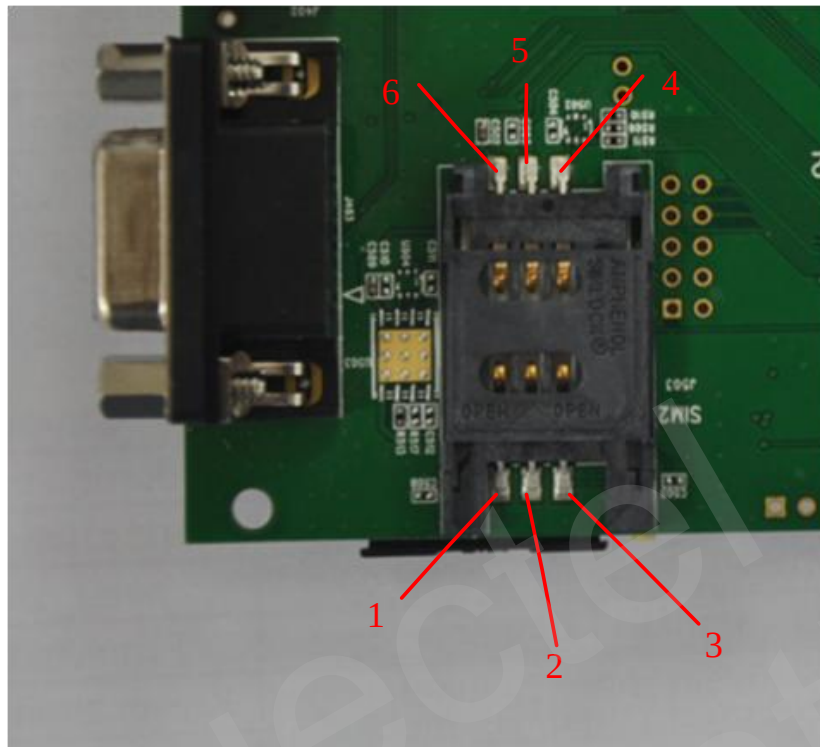


Figure 8: SIM2 card interface

Table 8: Pins of SIM card interface

Pin	Signal	I/O	Description	Note
1	GND		Ground	Not supported at present
2	VPP		Not connected	
3	SIM2_DATA	I/O	SIM card data I/O	
4	SIM2_CLK	O	SIM card clock	
5	SIM2_RST	O	SIM card reset	
6	SIM2_VDD	O	SIM power	

3.5. Antenna interface

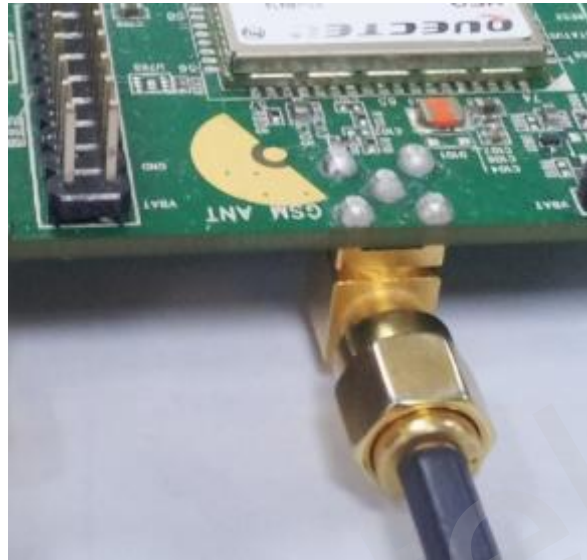


Figure 9: Antenna interface

3.6. Serial port and debug port

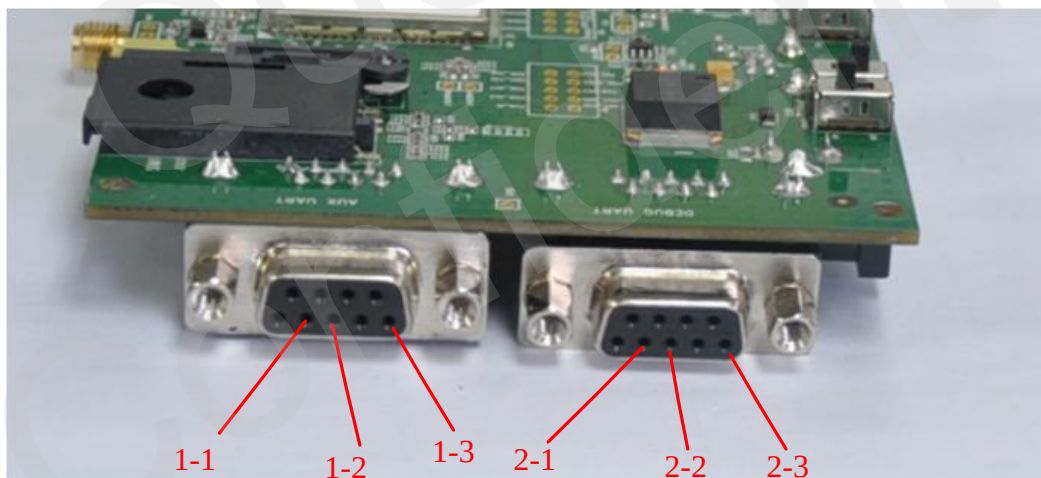


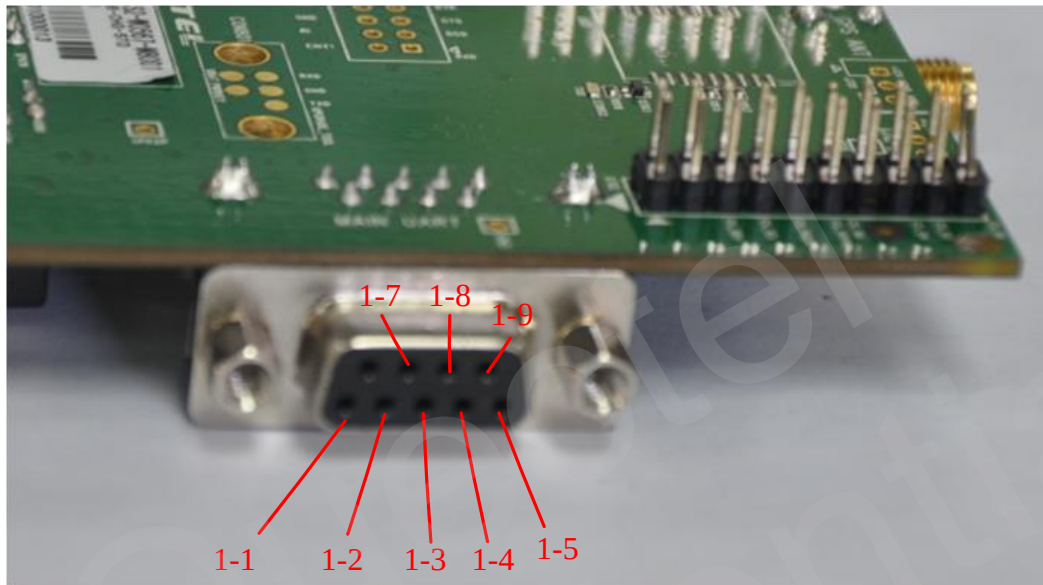
Figure 10: Auxiliary UART and Debug UART

Table 9: Pins of debug port

Pin	Signal	I/O	Description	Note
2_1	DBG_TXD	O	Transmit data	
2_2	DBG_RXD	I	Receive data	
2_3	GND		Ground	

Table 10: Pins of UART port3

Pin	Signal	I/O	Description	Note
1_1	TXD_AUX	O	Transmit data	
1_2	RXD_AUX	I	Receive data	
1_3	GND		Ground	

**Figure 11: Main UART****Table 11: Pins of serial port**

Pin	Signal	I/O	Description	Note
1_1	DCD	O	Data carrier detection	
1_2	TXD	O	Transmit data	
1_3	RXD	I	Receive data	
1_4	DTR	I	Data terminal ready	
1_5	GND		Ground	
1_7	RTS	I	Request to send	
1_8	CTS	O	Clear to send	
1_9	RI	O	Ring indicator	

3.7. Switches and buttons

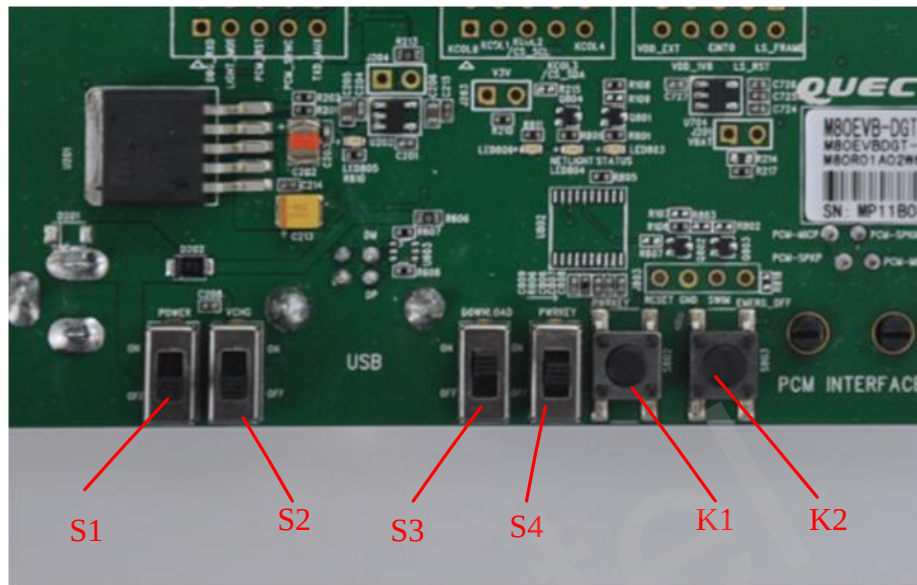


Figure 12: Switches and buttons

Table 12: Switches and buttons

Part	Name	I/O	Description	Note
S1	VBAT	I	Control power supply via adaptor	
S2	VCHG	I	Control charging if module has charging function	
S3	DOWNLOAD	I	Pull to “ON” when downloading firmware via USB	
S4	PWRKEY		Pull to “ON” when downloading firmware via UART	
K1	PWRKEY	I	Turn on/off the module	
K2	EMERG_OFF	I	Emergency button for shutting down the system	

3.8. Operating status LED

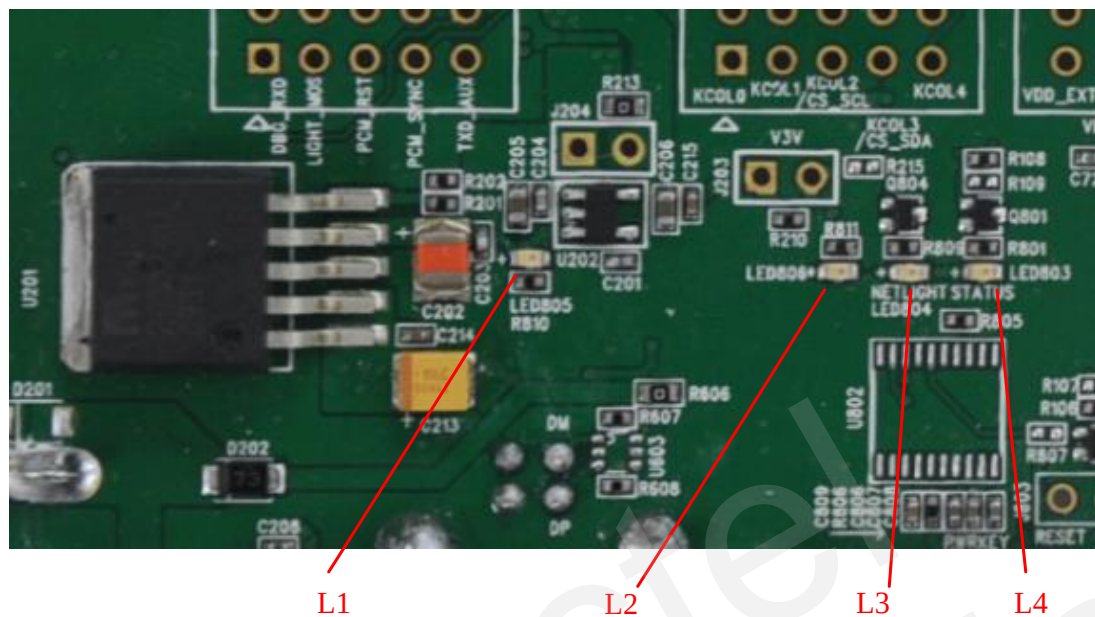


Figure 13: Operating status LED

Table 13: Status LEDs

Part	Name	I/O	Description	Note
L1	VBAT ON/OFF indicator	O	Bright: VBAT ON Extinct: VBAT OFF	
L2	RESERVED			
L3	GSM_NET status indicator	O	Blinking at a certain frequency according to various GSM network status	
L4	Module status indicator	O	Indication of module operating status	

3.9. USB interface

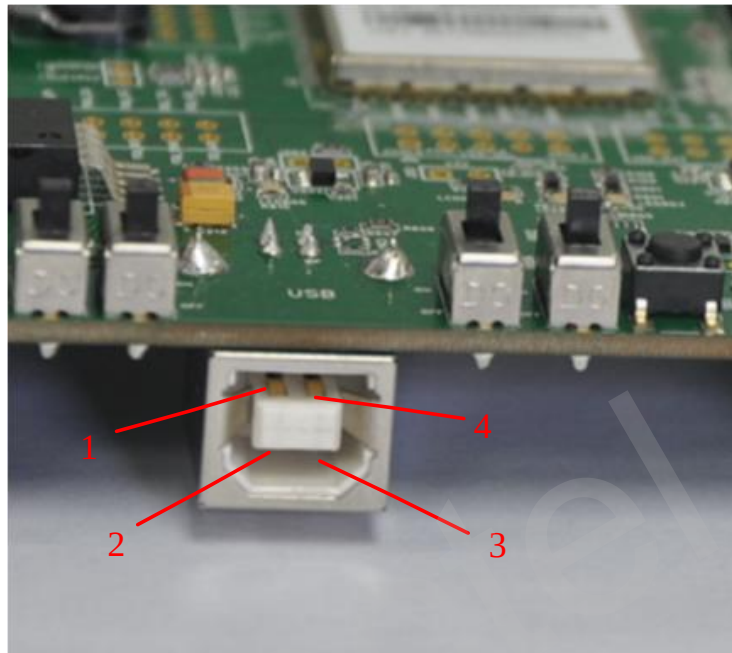


Figure 14: USB interface

Table 14: Pins of serial port

Pin	Signal	I/O	Description	Note
1	GND		GND	
2	VUSB	I	USB power	
3	USB_DM	I/O	USB data negative	
4	USB_DP	I/O	USB data positive	

3.10. Test points



Figure 15: Test points overview

3.10.1 CON101

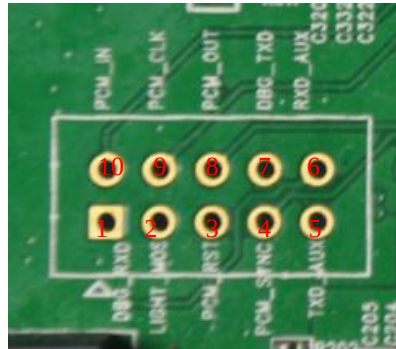


Figure 16: CON101

Table 15: Pins of CON101

Pin	Signal	I/O	Description	Note
1	DBG_RXD	I	Receive data	
2	RESERVED			
3	PCM_RST	O	PCM reset	
4	PCM_SYNC	O	PCM frame synchronization	
5	TXD_AUX	O	Transmit data	
6	RXD_AUX	I	Receive data	
7	DBG_TXD	O	Transmit data	
8	PCM_OUT	O	PCM data output	
9	PCM_CLK	O	PCM clock	
10	PCM_IN	I	PCM data input	

3.10.2 CON102

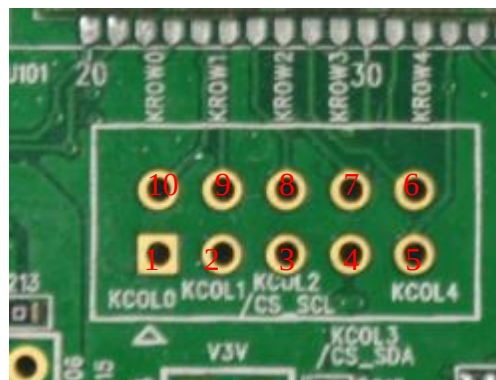


Figure 17: CON102

Table 16: Pins of CON102

Pin	Signal	I/O	Description	Note
1	RESERVED			
2	RESERVED			
3	RESERVED			
4	RESERVED			
5	RESERVED			
6	RESERVED			
7	RESERVED			
8	RESERVED			
9	RESERVED			
10	RESERVED			

3.10.3 CON103

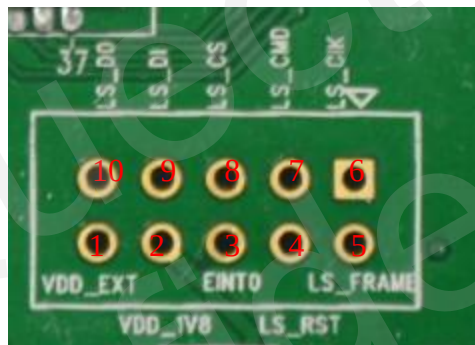


Figure 18: CON103

Table 17: Pins of CON103

Pin	Signal	I/O	Description	Note
1	VDD_EXT	O	Supply 2.8V voltage for external circuit.	
2	VCC_1V8			
3	EINT0	I	External interrupt	
4	RESERVED			
5	RESERVED			
6	RESERVED			
7	RESERVED			
8	RESERVED			
9	RESERVED			
10	RESERVED			

3.10.4 CON104

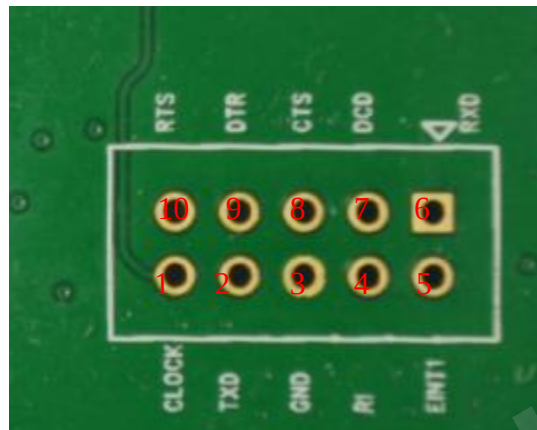


Figure 19: CON104

Table 18: Pins of CON104

Pin	Signal	I/O	Description	Note
1	RESERVED			
2	TXD	O	Transmit data	
3	GND		GND	
4	RI	O	Ring indicator	
5	EINT1	I	External interrupt	
6	RXD	I	Receive data	
7	DCD	O	Data carrier detection	
8	CTS	O	Clear to send	
9	DTR	I	Data terminal ready	
10	RTS	I	Request to send	

3.10.5 CON105

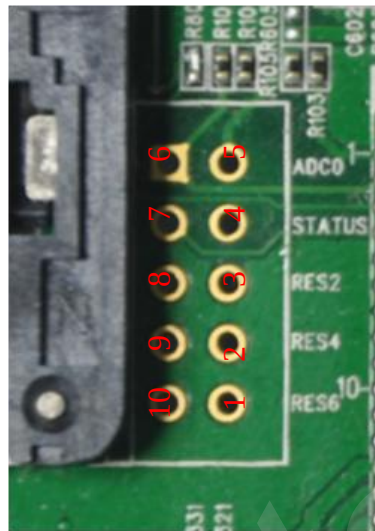


Figure 20: CON105

Table 19: Pins of CON104

Pin	Signal	I/O	Description	Note
1	RESERVED			
2	RESERVED			
3	RESERVED			
4	STATUS	O	Indicate module operating status	
5	ADC0	I	General purpose analog to digital converter.	
6	ADC1	I	General purpose analog to digital converter.	
7	NETLIGHT	O	Network status indication	
8	RESERVED			
9	RESERVED			
10	RESERVED			

4. EVB accessories assembly

Generally, the EVB and its accessories are equipped as Figure 21.



Figure 21: EVB and accessories equipment

5. Illustration

5.1. Power on

- (1) Insert the plug of the 5V power adapter.
- (2) Switch S1 to **ON** state, Switch S2 to **OFF** state, Switch S3 to **OFF** state, and Switch S4 to **OFF** state. The LED L1 on the EVB will be bright.
- (3) Press the K1 button (PWRKEY) for about 2 seconds. The LED L4 will be on and indicates the working mode of module. When L4 is on, the module begins running. Otherwise, please check the circuit.
- (4) The LED L2 will be blinking at a certain frequency. The GSM working status of the module can be judged by this LED.

Please refer to **document [3]** for detailed network status indication. .

5.2. Communicate with the module

- (1) Plug USB to UART cable to PC and EVB correctly.
- (2) Open the HyperTerminal (AT command window) on PC. The location of the HyperTerminal in windows XP is: START →program →accessory →communication →HyperTerminal. Set appropriate Baud Rate (such as 115200 bps) and COM number which can be checked by the Device Manager on PC.
- (3) Connect an antenna to M80-EVB with an RF cable.
- (4) Insert SIM card into the SIM1 card socket.
- (5) Insert earphone or handset into audio interface.
- (6) For Power On operation, please refer to **chapter 5.1**.
- (7) After waiting for 2~3 seconds, customer should first input “AT” or “at” string once or more until receiving “OK” from the module in the HyperTerminal.
The module is set to autobauding mode in default configuration. This operation is to synchronize the baud rate between the computer and the module.
- (8) Input AT command and the module will execute its corresponding function.
Customer can refer to **document [1]** for the details of AT commands. For instance, when input “ATD112;” an emergency call is established.

5.3. Firmware upgrade through main UART

- (1) Plug USB to UART cable to PC and EVB correctly.
- (2) Start the Firmware Upgrade Tool in the PC.
- (3) Press the **START** button in the Firmware Upgrade Tool.
- (4) Switch the S4 and S1 in the EVB to **ON** state

After these steps, the firmware refreshing process will be proceeding. For more details, please refer to **document [4]**.

5.4. Turn off

Press the PWRKEY button for about 2 seconds, the module will be turned off.

5.5. Emergency off

Press the EMERG_OFF button for more than 0.2 second, the module will be shut down immediately. After that, the module can be restarted by pressing the PWRKEY button. Please note that this operation is harmful to the whole module system and should only be done in emergency such as failing to turn off the module through the PWRKEY button.

5.6. Auxiliary UART

Quectel module provides two UART ports for achieving Dual UART.

AT+QEAUART=1 which is sent via main UART is used to enable auxiliary UART. Please restart the module after executing the command. For more details, please refer to **document [5]**.

Auxiliary UART only includes TX data (TXD), RX data (RXD). For the connection of auxiliary UART, please refer to Figure22.

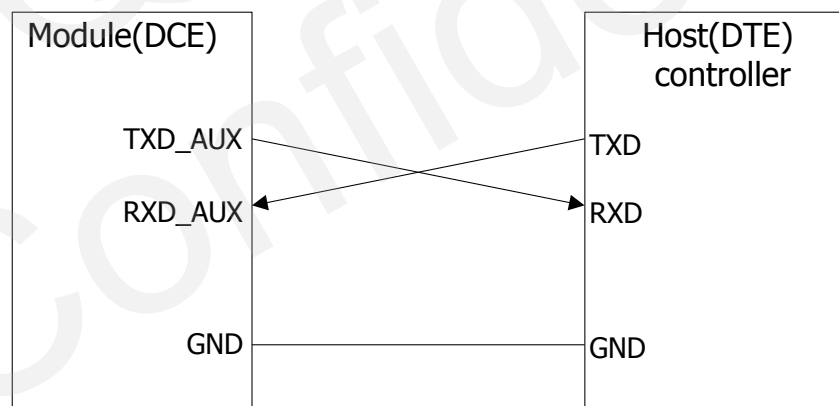


Figure 22: Connection of auxiliary UART



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